IN THE CLAIMS

1. (Currently amended) A method for using surface and curve functions and positions in a CAD model to define the geometry of a shape to allow the transformation of the shape with ~~an arbitrary~~ a function, said method comprising the steps of:

~~a.~~ Obtaining a solid model containing one or more faces, edges and/or vertices, where the underlying geometry of each face, edge or vertex may be represented, respectively by a surface, curve, or position, and each surface or curve may be represented by a function mapping from a domain space into 3-dimensional space;

~~b.~~ Defining a transformation function mapping from 3-dimensional ~~3-dimenional~~ space to 3-dimensional space;

~~c.~~ Creating new surface and curve functions by performing function composition with each of the existing surface and curve functions with the transformation function;

~~d.~~ Creating new, surfaces and curves by taking each point in the domain of each of the original surface and curve functions and passing the point through the corresponding new function, and creating new positions by passing each original position through the transformation function; and

~~e.~~ Resetting the geometry of the CAD model.

2. (New) A method for transforming the geometry of a solid model with a transformation function, comprising the steps of:

providing a solid modeler;

obtaining a solid model having a topology and a geometry corresponding to said topology;

defining a transformation function; and

transforming the geometry of the solid model by said transformation function.

3. (New) The method as claimed in claim 2, where the topology comprises one or more faces, edges and vertices.

4. (New) The method as claimed in claim 3 where the geometry is comprised of a set of one or more functions, where each function defines a surface, curve or position of said geometry.

5. (New) The method as claimed in claim 4 where each surface in the geometry corresponds to a face in the topology, each curve in the geometry corresponds to an edge in the topology and each position in the geometry corresponds to a vertex in the topology.

6. (New) The method as claimed in claim 4, where the step of transforming the geometry of the solid model further comprises the steps of:

composing each function in the set of functions of the geometry with the transformation function to create a set of one or more transformed functions; and

resetting the geometry of the solid model to the set of transformed functions.

7. (New) The method as claimed in claim 2, further comprising the step of displaying the solid model after the step of transforming the geometry.

8. (New) The method as claimed in claim 2, further comprising the step of storing said solid model after the step of transforming the geometry.

9. (New) The method as claimed in claim 2 where the geometry of the solid model has a domain space having three dimensions.

10. (New) The method as claimed in claim 2 where the geometry of the solid model has a domain space having greater than three dimensions.

11. (New) The method as claimed in claim 2 where the transformation function defines a non-linear transformation.

12. (New) The method as claimed in claim 2 where the transformation function defines a bend transformation.

13. (New) The method as claimed in claim 2 where the transformation function defines a stretch transformation.

14. (New) The method as claimed in claim 2 where the transformation function defines a twist transformation.

15. (New) A method for transforming a solid model using a generalized transformation function mechanism, comprising the steps of:

providing a computer aided design system adapted to display a solid model and having a transformation component adapted to transform said solid model using a transformation function;

obtaining said solid model, wherein said solid model has a geometry and a topology;

displaying said solid model;

obtaining a transformation function;

operating said transformation component to transform the geometry of said solid model with said transformation function;

displaying the solid model after the geometry has been transformed with said transformation function; and

storing said solid model after the geometry has been transformed with said transformation function.

16. (New) The method as claimed in claim 15, where the topology comprises one or more faces, edges and vertices.

17. (New) The method as claimed in claim 16 where the geometry is comprised of a set of one or more functions, where each function defines a surface, curve or position of said geometry.

18. (New) The method as claimed in claim 17 where each surface in the geometry corresponds to a face in the topology, each curve in the geometry corresponds to an

edge in the topology and each position in the geometry corresponds to a vertex in the topology.

19. (New) The method as claimed in claim 17, where the step of transforming the geometry of the solid model further comprises the steps of:

composing each function in the set of functions of the geometry with the transformation function to create a set of one or more transformed functions; and

resetting the geometry of the solid model to the set of transformed functions.

20. (New) The method as claimed in claim 15 where the geometry of the solid model has a domain space having three dimensions.

21. (New) The method as claimed in claim 15 where the geometry of the solid model has a domain space having greater than three dimensions.

22. (New) The method as claimed in claim 15 where the transformation function defines a non-linear transformation.

23. (New) The method as claimed in claim 15 where the transformation function defines a bend transformation.

24. (New) The method as claimed in claim 15 where the transformation function defines a stretch transformation.

25. (New) The method as claimed in claim 15 where the transformation function defines a twist transformation.